ABSTRACT OF THE DISCLOSURE

Systems and methods of the present invention measure at least one reflecting surface of an object disposed along an optical path. In some embodiments a measured optical interference signal for each of at least three wavelengths of reflected light may be used to determine a modulation of frequency components of a Fourier series. Frequency components of a Fourier series may be transformed to spatial components that describe intensities and positions of light reflected along an optical path.

Systems and methods of the present invention permit rapid measuring and may monitor corneal thickness during surgery. The invention may do so by integrating an ablation device and a measurement apparatus into a single system. An integrated scanning and monitoring system may include an ablative light source producing an ablative beam and a measurement light source producing a measurement beam.